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1 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2 REGION II
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7 PUBLIC MEETING
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9 TUTU WELLFIELD SUPERFUND SITE
10 CURRICULUM CENTER
11 386 ANNA'S RETREAT
12 ST. THOMAS, U.S. VIRGIN ISLANDS
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12 The following is a transcript of the
13 United States Environmental Protection Agency, Region
14 II, Public Meeting on the Tutu Wellfield Superfund
15 Site, before JULEE NORMAN, C.S.R, held on the 5th day
16 of March 1996, at the Curriculum Center, 386 Anna's
17 Retreat, St. Thomas, United States Virgin Islands.

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P R O C E E D I N G S

MS. JOHNSON: Okay. Good evening. Do you hear me? Okay, fine. Good evening. I'm Lillian Johnson, and I'm in charge of the community relations program at EPA. Now many of you have seen me so I don't have to tell you any more than that. Tonight we're certainly very, very happy to welcome you here, and we're especially happy to be here because when some of us left New York yesterday morning, the temperature was about 14 degrees and we still had snow on the ground from the weekend storm. So it was such a pleasure to fly into this beautiful weather here in St. Thomas.

Also, many of you know that when we were here last April, we said to you at that time that we were going to return -- well, we wanted to return last summer, but that didn't materialize. So we scheduled meetings to come back to visit with you in September. And, of course, due to the hurricanes, we were not able to make the meetings. In addition, we've had some budget situations, which I'm sure many of you are aware of, but before that occurs again, we decided we better try to get this meeting in. So we're especially glad that we were able to be here at this time.

Now about this meeting, when we were

1 here the last time, it was more of a very, very
2 informal meeting. Caroline just wanted to really give
3 you an update on where we were with our site
4 activities. This time we're here really to present
5 information to you concerning the result of the
6 remedial investigation and feasibility study that we've
7 conducted and also to present to you the proposed plan
8 where we are certainly asking for your comments.

9 As part of the community relations
10 process, we hold meetings such as this so that we can
11 get your input. In addition to the public meeting,
12 however, you can always write in your comments.

13 Now there -- we really had a couple of
14 public comment periods on this site. Due to the fact
15 that we had originally planned to come down last
16 September, we had scheduled a public comment period
17 that started around August 23rd, and it was scheduled
18 to end September 22nd. Since we were not able to do
19 the meeting at that time, we have since rescheduled the
20 public comment period. And the present comment period
21 started February 12th, and it's scheduled to end on
22 March 13th. So you have time to get any written
23 comments in that you need to in addition to giving us
24 your comments here tonight.

25 For those of you who would like to

1 review some of the documents that have been produced on
2 this site, there are two repositories in place. One is
3 right here in this building and the other is at DPNR's
4 building at the Wheatley Shopping Center. So if for
5 some reason you would like to look at some of the
6 documents in these two locations, that beautiful orange
7 form --

8 MS. HARSCH: Can you speak up, please?
9 I can't hear you over the air-conditioning.

10 MS. JOHNSON: Sure. That beautiful
11 orange form that you have will give you the listing of
12 the times that the repositories are open.

13 Normally at these public meetings we try
14 to make very, very short presentations, but tonight we
15 do have a lot of information we need to share with you,
16 so it's going to be a little bit longer than we would
17 normally have because it's so important that we give
18 you all the necessary information that's going to help
19 you understand the process that is the Superfund
20 process as well as to help you understand what it is
21 we're doing to clean up this site.

22 Okay. Now let me tell you who's with us
23 here tonight. First of all, we have Caroline Kwan, who
24 is the project officer on this site, and Caroline has
25 been with this site now for, what, ten years or so?

1 MS. KWAN: No.

2 MS. JOHNSON: Caroline has been the only
3 EPA project manager on this site.

4 In addition to Caroline, many of you
5 know Melvin Hauptman. Mel is chief of the Caribbean
6 and the New York Superfund Section.

7 We have two risk assessors. We have
8 Mark Maddaloni, who's really with the environment and
9 protection agency, and Mark is going to be talking
10 about the human health risk assessments. And then we
11 have Sally Odland, who is with Camp, Dresser and McKee.
12 She's the contractor to EPA who -- Sally has been with
13 the project for a long time and she has been working
14 very closely with us. In addition, we have a young man
15 over here, Lee Dioso. Lee is also with Camp, Dresser
16 and McKee, and he is working as our community relations
17 support person.

18 There are some other people in the
19 audience tonight, and we may have to hear from them
20 before the evening is over. We have representatives
21 from DPNR and we also have representatives from ATSGR.

22 Now before we get started, I just want
23 you to know that we are recording this meeting. As
24 part of the public participation process, we are really
25 required by law to have a transcript of this public

1 meeting. So we do have a transcriber here. So when we
2 get to the question and answer period, we're going to
3 ask you to please stand up and give her your name and
4 speak I guess louder than I am, so that she can hear
5 what you're saying. And I'm sorry, I have an oversight
6 here. Our attorney, my friend, Andy. We have Andrew
7 Praschak here. Andy is the attorney, EPA's attorney on
8 this site, and Andy's located in our Caribbean field
9 office.

10 Okay. Now we'll get started now with
11 Caroline. And what we're going to -- all right. Fine.
12 We've made a little change here on our agenda. So what
13 we have is a ten-minute videotape and the tape will
14 kind of run you through the Superfund process.

15 [VIDEOTAPE WAS PLAYED.]

16 MS. JOHNSON: Okay. We just wanted to
17 show you the videotape to give you a little background
18 on what Superfund is all about and that's really
19 intended for you who not familiar with the process.

20 Now I really want to introduce you to
21 the star of our show, and it's Caroline. And St.
22 Thomas should be very proud of Caroline. Caroline
23 knows all the really good restaurants. Caroline knows
24 where to get all the really good bargains, and Caroline
25 stays at the best places on St. Thomas. So I give you

1 our star, Caroline.

2 MS. KWAN: Thank you.

3 Hi, I'm Caroline Kwan from the U.S. EPA,
4 the project manager for the Tutu well site. As you
5 heard from Elliot Laws, our administrator of EPA in
6 Washington, how a Superfund applies to a particular
7 site. And I want to just at this point tell you how we
8 applied the Superfund at the Tutu well site. I want to
9 give you the location and the background and what we
10 did during the remedial investigations and feasibility
11 studies. At the end I would like to present the
12 various remedial cleanup alternatives for this project
13 for the Tutu well site, how we clean up the
14 groundwater, how we propose to clean up the groundwater
15 and the soil at the Tutu well site.

16 First, the historical perspective. The
17 Tutu well site is located at Anna's Retreat at the
18 eastern end of St. Thomas along Highway 38. There are
19 various commercial establishments along the highway
20 such as gasoline stations, car repair shops, shopping
21 centers, dry cleaners, fast food restaurants along this
22 route.

23 Some of the site background for the Tutu
24 well site is back in July 1987, Mr. Eric Tillett
25 noticed an odor emanating from his well. He contacted

1 the Department of Natural Resources, and DPNR in turn
2 contacted EPA for assistance. EPA tested wells and
3 detected various chemicals in these wells. The various
4 chemicals detected in these wells are 1, 2
5 dichloroethylene, abbreviated DCE; trichloroethylene,
6 abbreviated TCE; tetrachloroethylene or
7 perchloroethylene, abbreviated PCE. We also found
8 benzene, toluene, ethylbenzene and xylene, abbreviated
9 BTEX.

10 Shortly after, the Department of
11 Planning and Natural Resource closed these wells,
12 closed some of these wells to protect human health.

13 In January 1988, EPA initiated a
14 Superfund removal action. This consists of cleaning
15 and disinfecting the contaminated cisterns. We redid
16 the plumbing of the housing where the well was closed
17 down and provided trucked water to the affected
18 residents in the Tutu area, and we also initiated a
19 groundwater monitoring program.

20 In March of 1990, EPA issued an
21 administrative order to Texaco, Esso and O'Henry Dry
22 Cleaners to take over EPA removal actions as I
23 described above. To this date, Esso, Texaco and
24 O'Henry has been providing trucked water to the
25 affected residents to the Tutu wellfield.

1 In February 1992, EPA proposed the Tutu
2 well site on the National Priorities List, and it
3 became finalized September 29th, 1995, this past
4 September.

5 On February 19th, '92, Esso and Texaco
6 signed an administrative consent order to conduct the
7 remedial investigations and feasibility studies, the
8 RI/FS abbreviated, for the Tutu well site.

9 All of the Superfund sites usually
10 undergo remedial investigations. The purpose of the
11 remedial investigation is to identify and characterize
12 the potential source, the horizontal and vertical
13 extent, the rate, direction of transport, potential
14 migration pathways for contaminants such as petroleum
15 hydrocarbons, volatile organic compounds, VOCs
16 abbreviated, in groundwater and in soils.

17 In the conclusion, some of the
18 conclusions of the studies are the hydrogeology. The
19 aquifer underlying the Tutu well site is a makeup of
20 fractured volcanic bedrock and the groundwater flow is
21 toward the lower Turpentine Run. This is the
22 groundwater flow which I'm going to draw.

23 During Phase I of the remedial
24 investigation, which we conducted from April of 1992 to
25 December 1992, we installed 19 groundwater monitoring

1 wells, 8 surficial soil samples, 17 soil borings. All
2 of these samples were analyzed for volatile organic
3 compounds and metal compounds.

4 During Phase II of the remedial
5 investigation, which we conducted from April 1994 to
6 July 1994, we sampled a total of 51 monitoring wells
7 and 15 supply wells.

8 Some of the results of this work -- in
9 addition to the remedial investigation, EPA also
10 conducted a vadose zone modeling, which Sally Odland
11 will describe in a little detail later on in her
12 presentation. The result of this modeling, which we
13 call the soil screening levels, were used as a guidance
14 value to identify soil areas that may require
15 remediation cleanup based on the potential for leaching
16 of contaminants into the groundwater. Some of the soil
17 impact properties that exceeded this soil screen level
18 are Ramsay Motor, Texaco Tutu Service Station, Esso
19 Tutu Service Station, Western Auto/Four Winds Plaza,
20 O'Henry Dry Cleaners and the Curriculum Center.

21 The groundwater study we have conducted
22 identified northern and southern groundwater plumes.
23 At the northern groundwater plume, at the northern
24 groundwater plume, we have about 78 parts per billion,
25 ppbs, to 2100 parts per billion of volatile organic

1 compounds. Also within the northern plume, we detected
2 benzene, toluene, ethylbenzene at the Texaco station
3 3,700 ppbs to 21,000 ppbs; and at the Esso Service
4 Station, we detected 4,000 ppbs to 22,000 ppbs of
5 benzene, toluene and ethylbenzene.

6 At two locations, at two locations, we
7 suspect that there's a dense non-aqueous phase liquid.
8 We call it DNAPLs abbreviated. DNAPLs is a nonsoluble
9 liquid such as hydrocarbons or/and solvents. They are
10 denser than water. This could act as a continuous
11 releasing source of contaminants into the groundwater,
12 into the aquifer. The two suspected places are O'Henry
13 Dry Cleaners and the Curriculum Center.

14 Now I turn over our next presenter of
15 Mark Maddaloni, our risk assessment person in the EPA.

16 MR. MADDALONI: Thank you, Caroline.

17 As Caroline mentioned, I'm here to
18 discuss the results of the risk assessment for the
19 site. And rather than just rattle off some numbers
20 which might be difficult to interpret, allow me to walk
21 you through the EPA risk assessment process.

22 Let me just begin by saying that there's
23 no mystery to risk assessment. We do it all the time.
24 When you decide to cross a street, there's a certain
25 risk associated with that activity, namely being hit by

1 a car. So if you are down in town and dash across
2 during heavy traffic, you increase the risk of that
3 likelihood, whereas if you wait for a green light, you
4 reduce the risk.

5 The point I'm trying to make is that
6 risk assessment is a process that regularly plays
7 itself out in our everyday lives. We just tend to do
8 it intuitively. Now, admittedly, assessing risk at a
9 Superfund site is considerably more complex, and EPA
10 has just formalized the process in response to that,
11 and let me walk you through it.

12 It's a four-part affair consisting of
13 hazard identification, exposure assessment, dose
14 response or toxicity assessment, and finally, we wrap
15 those three, those three components into what we call a
16 risk characterization where we're then able to make
17 numerical determinations about the amount of risk at a
18 site.

19 So let me begin with the first part, the
20 hazard identification. The first thing we need to know
21 about when we approach a hazardous waste site -- I
22 guess that means you can't hear me back there. All
23 right. I'll try to talk louder.

24 The first thing we need to know about
25 when we approach a hazardous waste site are what are

1 the chemicals of concern. And EPA has developed what's
2 called a target compound list, which is an extensive
3 assembly of contaminants that are known to be
4 associated with hazardous waste sites.

5 And as Caroline was detailing, we also
6 do a very thorough site history. So in the event that
7 there's some sort of unusual chemical that we wouldn't
8 typically analyze, we have that capacity. So we take
9 all this analytical data that we collect, and then we
10 do things like look at its concentration, we look at
11 the frequency of detection, we make comparisons with
12 background concentrations for naturally occurring
13 elements, and we are finally able to boil this, believe
14 me, rather lengthy list of chemicals down to what we
15 call our contaminants of concern. And these are the
16 main chemicals that are potentially driving risks at
17 the site. And at Tutu, I think Caroline referred to
18 most of them. A lot of chlorinated hydrocarbons,
19 perchloroethylene, vinyl chloride, benzene, and some
20 inorganics, arsenic most notably.

21 So now we take this information from the
22 hazard identification, and we move into the next step
23 which we refer to as the exposure assessment. And
24 there we're looking at the affected populations,
25 whether they be residents or various types of workers,

1 trespassers, whatever is appropriate for that site
2 situation. And we look at these what we call receptors --
3 I know it's a cold sounding term, but we'd look at
4 these people that are potentially impacted, and we are
5 essentially asking ourselves two questions: Where are
6 these contaminants and how do they get into my body?

7 Well, where are they? They could be in
8 any of the environmental media. And, again, we look at
9 soils, and we look at soils that have sediments, and in
10 addition, water, groundwater, which is a very big issue
11 at this site. If there were surface waters,
12 reservoirs, rivers, streams, we'd look at that. If
13 there's contaminants in the air, we'll look in the air.

14 How do they -- how do contaminants get
15 into the body? There are what we call three main
16 portals of entry into the body. Your most prominent is
17 ingestion of contaminants. You could also be exposed
18 through your skin by getting contaminants on the skin;
19 and finally, by inhaling them.

20 And then it pretty becomes a matter of
21 mixing and matching. You're looking at the impacted
22 media and the different exposure pathways, and you see
23 if you have a completed what we call an exposure
24 pathway. And, well, one of the most prominent here at
25 Tutu is, naturally, we have a lot of residents in the

1 area and the groundwater is contaminated. Don't drink
2 the groundwater. That's an exposure pathway.

3 We know children incidentally ingest
4 soil and even adults to a lesser extent. So if there's
5 contaminated soil, you have again populations impacted.
6 That's another exposure pathway and so on and so forth.
7 We look at a lot of different worker-type activities in
8 addition to the residents.

9 Now, so we've identified our chemicals
10 that we're concerned with, and now we have, you know,
11 looked at the ways people could get exposed. And what
12 we're trying to grasp here is what kind of dose they
13 may be impacted by. And the next step is what we call
14 the dose response or, of course, toxicity assessment.
15 And EPA divides toxicity assessment up into two main
16 categories: cancer and non-cancer.

17 So let me talk about the cancer-causing
18 agents first. Current scientific thinking indicates
19 for the most part that carcinogens do not possess a
20 threshold. And what that means is that any exposure to
21 a carcinogen, no matter how small, can at least
22 theoretically cause some infinitesimal yet finite
23 increase in the cancer risk. And as a consequence of
24 that, by convention we always display cancer risk as a
25 probability. It's always one in something. And you've

1 probably seen government agencies, perhaps EPA or
2 something like FDA, saying, if you, you know, eat these
3 grapefruits that are sprayed with pesticides, you'll
4 have a one in a thousand or a one in a million excess
5 lifetime cancer risk. Okay. Since there's no
6 threshold, there's always some probability of the event
7 occurring.

8 And what we then do is generate
9 information on the cancer-causing potential of common
10 contaminants and combine that with information from the
11 exposure assessment, essentially dose, and by combining
12 the dose with the potency of the carcinogen, we can
13 then make a numerical determination of cancer risk as
14 presented as a probability, one in something.

15 Let me put cancer on the back burner for
16 a few moments, but I'm going to get back to it when we
17 talk about the risk characterization, and let me spend
18 some other time on something that tends to get played
19 down because it's not as sensationalized as cancer, and
20 that's not the non-cancer causing agents. What I mean
21 by that is that just any agent or any effect other than
22 cancer. Mostly, it's to major organs, like liver,
23 kidney, nervous center, respiratory system or some
24 other vital body part.

25 And the way we assess non-carcinogens is

1 with what we calling a reference dose. Now a reference
2 dose is a measure of an agent's threshold because
3 non-carcinogens are believed to possess a threshold.
4 So the reference dose that EPA generates is again a
5 measure of an agent's threshold-causing effect to which
6 many safety factors have been added.

7 And I just want to spend a few more
8 moments on this concept of threshold because it's very
9 important in the EPA decision-making process. You
10 might reasonably say that if you found contamination,
11 any contamination in whatever, you know, wherever you
12 looked for it, you'd say, you know, just get rid of it.
13 That sounds, that sounds sensible, but in a sense,
14 EPA's a victim of its own successes in that we
15 currently possess the capacity or the analytical
16 technology to measure such extraordinarily small
17 amounts of contaminants in whatever media we're looking
18 at that if we were to say -- take the approach to
19 excavate any soil that you could find the smallest
20 trace of contamination in, we would literally be moving
21 the first few feet off the entire island. And I think
22 you could all appreciate that this would not be a very
23 effective way of administering this program and
24 allocating limited resources.

25 So EPA uses toxicity thresholds to set

standards that are first and foremost protective of the public health and yet practical at the same time. And perhaps I could give you an example of a toxicity threshold that you could probably relate to easily, and probably most of you have heard of the gas carbon monoxide. It can be devastatingly poisonous and you probably most have heard of, you know, these horror stories where whole families have got wiped out from a clogged up flue pipe. We, in fact, in our New York office have lost a division director because of that exact situation, a clogged up flue pipe. Just one or two weeks ago one of our colleagues passed away for that. So it's a very real threat.

Anyway, the point I'm making is that in this sort of situation, we have the levels, the concentrations of carbon monoxide in the environment have vastly exceeded this threshold for causing effect and its results could be devastating, but carbon monoxide is a byproduct of the combustion process. So whenever anything burns, some carbon monoxide is given off. And, again, as I was saying, with a sufficiently sophisticated instrument, you could detect carbon monoxide just almost anywhere. You certainly would be able to detect it in this room, but again the point being that it would be in decidedly subthreshold

1 concentrations, and we're apparently none the worse for
2 inhaling an occasional molecule of carbon monoxide. So
3 that's how we handle toxicity thresholds.

4 Now, so we've identified our
5 contaminants at the site. We've made some judgments,
6 conservative judgments about how people might be
7 exposed to them. We've looked at the types of
8 toxicity, cancer and non-cancer causing. And finally,
9 we're able to make some numerical statements about the
10 risk. And again, this is divided up into cancer and
11 non-cancer causing, well, concerns.

12 Let me deal with cancer again first.
13 EPA has established an acceptable cancer risk range of
14 from one in ten thousand to one in a million. What
15 that means is if, due to a site-related hazard, if your
16 excess lifetime cancer risk is greater than one in ten
17 thousand, that generally obligates EPA to take action.

18 And I just again would like to take a
19 moment to try to put this one in ten thousand in some
20 sort of perspective. The baseline cancer rate in our
21 society is approximately 25 percent, maybe even a
22 little higher. So one in four people over the course
23 of their lifetime contracts cancer. That shouldn't
24 surprise anyone. I'm sure we all know individuals that
25 have been so afflicted.

1 And the scientific evidence, you know,
2 points to lifestyle factors as contributing the lion's
3 share of this baseline rate: smoking, without a
4 question; alcohol consumption; dietary concerns; low
5 fat -- low fiber, high fat diet; exposure to
6 ultraviolet radiation -- in other words, sunbathing,
7 which I know a lot of that is done around here.

8 Anyway, those are the types of things
9 that cause such a high baseline cancer rate. And I'm
10 not here to try to explain or justify why it's that
11 high, but suffice it to say that if you took a sample
12 population of 10,000 people, and followed them over the
13 course of their lifetime, you would reasonably expect
14 to find 2,500 cancer cases. That's 25 percent.

15 Now what EPA's saying is if you took
16 this same sample population of ten thousand and exposed
17 them for a long, for a long term -- we usually assume
18 residential exposure of 30 years. So if you were to
19 take that population and expose them chronically to all
20 the site-related contaminants, and if that population's
21 cancer risk was to have increased by one single case,
22 from 2,500 to 2,501, that would be deemed unacceptable
23 by the EPA.

24 And what we found at this site was that,
25 in fact, residential exposure, residential exposure to

1 drinking water did produce a significant cancer risk.
2 And you can see, we looked at children and adults. And
3 there are five in ten thousand for the children, and
4 six in ten thousand for the adults. And even
5 employees, there was over one in ten thousand. For
6 another type of workers, construction workers, it was
7 within our acceptable risk range.

8 So that's what I have to report.
9 Caroline and Mel will talk about what we intend to do
10 about that.

11 Now that's just half the picture, and
12 again we have to deal with the non-cancer causing
13 agents. And the way we evaludate those is that we
14 utilize what's called a hazard index. That's
15 designated there by -- well, it's hazard. It should
16 say hazard index there. And that is defined as the
17 chronic daily in-take or the dose of contaminants
18 divided by what I referred to earlier as the reference
19 dose, remembering that the reference dose again is the
20 measure of that contaminant threshold for causing
21 effects with built-in safety factors. So if the
22 chronic daily injection -- again, we get that from the
23 exposure assessment. So if your regular exposure is
24 greater than the reference dose, then there is clearly
25 a potential for hazard there. And so if that fraction --

1 again, the dose divided by the the reference dose --
2 exceeds one, again that pretty much obligates EPA to
3 take action.

4 And what we saw in the groundwater was
5 that not only was it presenting a cancer risk, but you
6 can see by those numbers, 67, 29, they're all greater
7 than one. So it was also that all the non-cancer
8 causing agents were also in levels of concern.

9 And what we found -- let me back up for
10 one moment because I talked about the groundwater, and
11 we also looked at the site's soil. And the cancer risk
12 during the remedial investigation was actually in the
13 unacceptable range. We see it there as in one in ten
14 thousand.

15 Then something monumental occurred in
16 September, namely the hurricane, and literally changed
17 the topography of a lot of the areas. And we went back
18 and did additional sampling, and the main contributor
19 of the cancer risk in the soils at the Tillett's Garden
20 Art Center was just PCBs. The levels of PCBs were
21 significantly diminished. And based on our most recent
22 sampling data, our levels of risk in the soils at the
23 Tillett Gardens Art Center area are in the acceptable
24 range as well as the hazard index.

25 So, again, that's the result of the

1 human health risk assessment, and I'm going to turn it
2 over to Sally Odland of CDM to do the ecological. We
3 look at both human health and the environment or
4 ecological receptors.

5 MS. ODLAND: Thank you, Mark.

6 Let me know if you can hear me in the
7 back. Is this loud enough? Okay. I'll speak up a
8 little bit.

9 Now as Mark mentioned, EPA also looks at
10 ecological risk. Their primary concern is protecting
11 humans from site contaminants, but they're also
12 responsible for determining whether or not there might
13 be an impact to wildlife. The process is very similar
14 to the same sort of mathematical modeling that goes on
15 for the human health risk assessment.

16 First of all, you need to decide if
17 there's a problem or a hazard. That would involve
18 identifying a source and identifying receptors and a
19 pathway. Now the Tutu area is not really a pristine
20 wildlife area. It's fairly highly developed. There's
21 shopping centers and a number of residents, et cetera,
22 but there are places where there is contaminated
23 surface soil behind some of the properties that back on
24 to undeveloped areas, and it's not uncommon to have
25 wildlife in the form of lizards or iguanas or birds, et

1 cetera, that would come on to the properties and could
2 come into contact with contaminated soils and then
3 carry the contamination up the food chain.

4 So EPA decided to perform an ecological
5 risk assessment. The only media area that was
6 evaluated was soil because there's really no way for
7 the wildlife to come into contact with the groundwater.

8 This is called a food web. It's
9 basically a very simplified conceptual diagram of who
10 eats who among the ecological receptors. Now if you
11 start with the surface soils where the contamination
12 is, then those can be ingested by bugs or worms or
13 uptaken by plants or small animals who come into
14 contact with surface soils. And from there, they can
15 work their way up the food chain. We chose some
16 receptor species, two receptor species, one near the
17 bottom of the food chain, a lizard, the animal who
18 might logically consume insects for the most part that
19 have been in contact with contaminated soils, and then
20 a receptor high up the food chain, a bird of prey, the
21 hawk, because sometimes contaminants will biocumulate
22 or concentrate as they work their way up the food
23 chain.

24 These are the results of the ecological
25 assessment. Similar to the human health assessment,

1 there's a threshold value that EPA has determined. You
2 have similar chemicals of concern. In this case,
3 arsenic and PCEs and phenols are the main drivers. And
4 you add there, you look at the cumulative effects of
5 all of these contaminants on a potential receptor over
6 the lifetime of that animal, and you look at their
7 total body dose that they would accumulate and go
8 through some mathematical calculations to come up with
9 an index to compare the values you find to studies in
10 the literature of the concentrations of chemicals that
11 have been noted to have a health impact on similar
12 species or at least a species that's relatively closely
13 related. This doesn't necessarily mean death. This
14 could be limited growth or effect on reproduction, et
15 cetera.

16 Anyway, what we found was that at the
17 bottom of the food chain there was a moderate potential
18 for impact from the site contaminant levels to the
19 anoles, to the lizards. The hazard index was 138, and
20 that was assuming a worst case scenario, which is not
21 actually realistic. It's very conservative, but it
22 assumes that those lizards would consume almost a
23 hundred percent of their food from the most
24 contaminated part of the site, and they do have a
25 limited range, but obviously this would affect

1 individual lizards, not a whole population. They would
2 all have to be basically living within a very small
3 area where soils have been contaminated.

4 Higher up the food chain, the hawk had a
5 relatively low -- it exceeded the threshold, but it had
6 a relatively low hazard index because it has such a
7 large range and obtained a lot of its food from other
8 areas, other sources that might not be contaminated.

9 The risk drivers for the anoles were
10 arsenic, PCE and phenols, but these were restricted to
11 very small areas of soil on the Tutu site, principally
12 behind the O'Henry Dry Cleaner, and that was an area
13 that was already slated to be cleaned up because of
14 concerns of groundwater contamination. So, in fact,
15 this last summer those soils were excavated, and that
16 was after the assessment was performed. You would have
17 to say now that there's a minimal chance of exposure to
18 wildlife from site soils at the Tutu site.

19 So the question becomes, where does that
20 leave EPA with respect to the need to clean up soils?
21 They pose a minimal risk to human health and a minimal
22 risk to wildlife, but there's one other thing that
23 needs to be looked at before you can say, okay, leave
24 them alone, and that's, are those soils -- do they have
25 contaminants at sufficient concentrations that those

1 soils can leach their contaminants into groundwater by
2 the rain percolating through the soils?

3 So what we did was we did some back
4 calculations, some beta soil modelers, to determine
5 what concentrations of chemicals could remain in the
6 soils that would not pose a risk to groundwater. And
7 you have to work backwards to do this. You start with
8 groundwater and you take those chemicals that were
9 identified as risk drivers. Principally, the vinyl
10 chloride and the trichloroethylene, and -- well, the
11 DCE and vinyl chloride is a big risk driver, too, and
12 then there's other chemicals that are present way above
13 the drinking water standards, a lot of gasoline
14 constituents: the BTEX, benzene, toluene, ethylene,
15 xylene compounds are very much higher than the drinking
16 water standards.

17 So we took these two groups of chemicals
18 because there are two types of plumes at Tutu. There's
19 gasoline plumes and there's chlorinated solvent plumes.
20 And the chemicals in each group behaved similarly. We
21 picked an indicator chemical for each group that would
22 have the strictest cleanup levels because the drinking
23 water standards would be the lowest and it would move
24 the most quickly through the soils, be the most mobile.
25 We chose benzene to represent the gasoline constituents

1 and we chose PCE to represent the chlorinated solvents.
2 That way when you calculate a cleanup level for these,
3 you know that it's a conservative approach, you know
4 that it will be strict enough that by addressing
5 benzene, by default you will have cleaned up all of
6 these other related constituents because their cleanup
7 levels would be higher.

8 I should also point out that these were
9 to determine guideline values. There are no regulatory
10 levels for soils. So this was just a way of looking at
11 the individual properties and saying, does this
12 property pose a risk, an indirect risk to human health
13 through the groundwater migration pathway?

14 This is a schematic that explains a
15 little bit about what our groundwater or our beta soil
16 model does. We used a numerical simulation that was a
17 spreadsheet model that's does mathematical calculations
18 in a series of cells from the ground surface down to
19 the water table. We have two-inch cells. And each
20 time, you start with an initial concentration in
21 groundwater -- I mean, in soils, and you allow rain
22 water to percolate, and in each cell, that
23 contamination achieved equilibrium with soil and with
24 the rain water. Some of it sticks to the soil, absorbs
25 to the soil, some of it goes into the groundwater, and

1 at that point it can be attacked by microbes and it can
2 be converted into other compounds, but its
3 concentrations can be reduced, and then it moves on to --
4 it moves into the next cell at a lower concentration
5 than it was originally. And you repeat this
6 mathematical process from cell to cell to cell until
7 you reach the groundwater. And at that point the
8 concentration of leachate that has reached the
9 groundwater becomes further diluted by the groundwater
10 that was flowing through, but if you're working
11 backwards and saying, my groundwater has to be at five,
12 you can start a trial and error process and feed
13 additional concentrations into your model and you keep
14 plugging and chugging until you make sure that if this
15 concentration was on the site in time and years, you
16 feed in different trial concentrations until your model
17 shows you that the groundwater concentration will be at
18 or below the drinking water standard five. And the end
19 product of that -- this is for an individual property.
20 We did these for the four main properties that are at
21 the heads of the plumes. The end result -- again, this
22 is concentration in soil and depth in feet from the
23 ground surface -- shows that you can have a fairly high
24 initial concentration in soils up here, over 700 parts
25 per billion, but that's because there's organic carbon

1 near the surface that will bind the contaminants and
2 keep them from moving into groundwater. As you get
3 deeper -- in this case, when you hit bedrock at about
4 two or three feet -- the concentration that's allowable
5 is much, much lower because there's nothing to retard
6 the movement of contaminants. There's not as much
7 organic carbons. And the contaminant levels that were
8 here in the bedrock can rapidly leach into groundwater.
9 And if they were any higher, they would result in
10 modeled concentrations that were higher than the
11 drinking water standards.

12 So using that method on a property by
13 property basis, we came up with site specific soil
14 cleanup guidelines for EPA to apply to each of the
15 properties, and then they could take the site
16 concentrations of soils and look at every property and
17 say, does this area need to be remediated as a source,
18 a potential source of chemicals to groundwater.

19 I'm going to give this back to Caroline
20 now and she'll explain the remedial options that were
21 looked at.

22 MS. KWAN: That's why it took so long.
23 After we go through all this process, do the whole
24 investigation, the whole risk assessment to find out
25 what's going on, how we apply these data, these

1 analytical data, what concentration we put in, we come
2 up with a remedial action goal. We have to clean up
3 the groundwater here and we have to clean up the soils
4 in the Tutu well site. The soil impact and the
5 groundwater impact, we have both impacts at the Tutu
6 well site.

7 Now at the last part, we came up with
8 some remedial action goals, the cleanup goals. To
9 achieve these goals, how to achieve these goals and
10 what goals we are going to try to achieve.

11 Our goal is to remove and control the
12 source of groundwater contamination, restore the
13 aquifer for potable use at locations where DNAPLs are
14 not present, control further migrations of contaminated
15 groundwater, and eliminate leaching of contaminated
16 soil into the groundwater.

17 From these goals, we came up with
18 feasibility objectives. We want to develop potential
19 remedial alternatives to address environmental
20 problems, evaluate these potential remedial cleanup
21 alternatives through the EPA criteria established in
22 the federal regulations.

23 We have nine criteria that we go
24 through. The two threshold criteria are the overall
25 protection of human health and the environment. We

1 want to make sure that the remedial objectives and also
2 the cleanup objectives are in compliance with the
3 relevant and appropriate requirements. We want to make
4 sure the cleanup objectives are long-term effectiveness
5 and permanence. We want the reduction of toxicity,
6 mobility or volume through the treatment. We want to
7 make sure that the short-term effectiveness is short and
8 minimal. We want to make sure it's implementable and
9 the cost is not -- the cost is minimal. We want to
10 make sure DPNR is in concurrence with us. And lastly,
11 the community is in acceptance of this remedial
12 cleanup.

13 We have developed five soil remedial
14 alternative cleanup options for the Tutu well site.
15 The first one, we call it SRA abbreviated, Soil
16 Remedial Alternative 1: No action, institutional
17 pollution controls. These are described in the orange
18 pamphlet that we passed out today. It's described in
19 detail plus additional information is being provided in
20 the repositories and also in the administrative record
21 at the Curriculum Center and also at the DPNR office at
22 Wheatley Shopping Center.

23 SRA 2: We would want institutional
24 controls and capping in some of the impact areas.

25 SRA 3: We want to combine institutional

1 controls and capping. We want in-situ soil vapor
2 extraction, SVE, excavation and off-site disposal.

3 In Soil Remedial Action Alternative
4 number 4, we would like to combine institutional
5 controls, capping, ex-situ SVE, excavation and on-site
6 disposal.

7 Soil Remedial Alternative number 5, we
8 would like to combine institutional controls, in-situ
9 SVE, excavation and off-site disposal.

10 We have four groundwater cleanup
11 options. We named it GRA 1 abbreviated. GRA 1 is no
12 action with institutional controls.

13 GRA 2: We have institutional controls,
14 source containment, point of entry treatment -- POET,
15 P-O-E-T abbreviated -- systems, treatment and
16 discharge.

17 GRA 3: Institutional controls, plume
18 containment, treatment and discharge.

19 GRA 4: We'd like to combine
20 institutional controls, source and plume containment,
21 treatment and discharge.

22 We also have developed some discharge
23 options. We know that water is a valuable resource in
24 the Virgin Islands. After we treat this water, we
25 would like to either connect it to the existing WAPA

1 water main to be provided for the residents and
2 businesses or truck the treated water to the impacted
3 residents or install a water distribution system to the
4 impacted residents. And, lastly, which I did not put
5 down on my slide, which I do not like to do, is go to
6 waste. If all these three options do not work or are
7 not implementable, we might have to dump the treated
8 water to the waste, which is not an option we would
9 like to entertain because the treated water will be
10 drinkable to the federal -- you know, it will be
11 drinkable for everybody, and we just don't like to
12 discharge it to a sewer after we treat it.

13 Mel Hauptman, my boss, will be
14 describing what EPA and DPNR recommended for a remedy
15 for the Tutu well site. Mel.

16 MR. HAUPTMAN: Good evening. Now after
17 this long discussion and many years of investigating
18 this site, I'd like to describe to you what our
19 preferred remedy is for both soils and groundwater.

20 Let me do the easier of the two ones
21 first, which is soils. Now remember again these soils
22 are leaching their chemicals into the groundwater,
23 which makes the groundwater undrinkable at these
24 concentrations.

25 For our preferred remedy for soils,

1 we're recommending what we call institutional controls.
2 Those are controls over use of property and soils that
3 we are going recommend to the local authorities, mainly
4 DPNR, to implement for us, and those are to place
5 limitations on these impacted soils that have these
6 chemicals in them, namely, that we want these
7 properties primarily that are now commercial and
8 industrial to stay that way. We don't want these
9 properties to all of a sudden become residential
10 properties where the exposure situation and the risk
11 assessment that Mark described could be totally
12 different. So the industrial properties we want to
13 remain industrial. The commercial ones we want to
14 remain commercial. And we think that's going to happen
15 anyway.

16 We are recommending to the local
17 authorities to prohibit excavation and disturbance of
18 these impacted soils without government okay and
19 authority and approval because if we start digging in
20 these soils, you're going to probably make it worse and
21 make the transport to the groundwater worse; or if you
22 take these soils away from these properties and use
23 them somewhere else, they might have some other effect
24 on people than they are currently having. So we are
25 going to recommend that the soils not be disturbed and

1 not be excavated and not be removed from the site
2 unless they have local authority and okay and EPA
3 authority and okay.

4 Now at the two properties that have
5 DNAPLs, we're going one step further. And these two
6 properties are the O'Henry Dry Cleaner and the
7 Curriculum Center. We're saying, don't disturb those
8 buildings and dig into the rock where these DNAPLs high
9 concentrations are and take that rock away and use it
10 somewhere else for the very same reasons.

11 Now I'm going to go property by property
12 and describe the alternatives that we prefer. For the
13 Esso Tutu gas station, we are recommending in-situ --
14 in other words, in place -- soil vapor extraction. And
15 that is nothing more than putting a drill rod in the
16 ground, drilling it in -- it has a lot of holes in it --
17 and applying a vacuum to that perforated pipe in the
18 area above the water table to extract the volatile
19 organic chemicals, the benzene and the xylene and
20 toluene, out of those soils and clean those soils up.
21 We call that SVE. And those off-gases will be treated
22 through thermal oxidation to make sure we can discharge
23 them to the atmosphere safely.

24 At Four Winds, we are proposing to take
25 away the dirty soils and dispose of them. This is only

1 part of the Four Winds Plaza. We're not talking about
2 the entire shopping center.

3 At O'Henry, and it's very similar to
4 what I'll describe for the Curriculum Center, it's
5 again in-situ soil vapor extraction and/or dig it out,
6 ex-situ, with the same kind of treatment but in a
7 controlled pile. For the bedrock, it will be done
8 in-situ only and again thermal oxidation for the gases.

9 The Curriculum Center looks very similar
10 to the O'Henry discussion that I just gave you. Again,
11 excavation, disposal, SVE treatment, putting back the
12 treated soils once they're cleaned, and SVE treatment
13 for the bedrock, and again thermal oxidation.

14 At the Texaco, in-situ soil treatment
15 and again catalytic oxidation for the gas.

16 Now that's the soil discussion property
17 by property.

18 For groundwater, again, there are a
19 bunch of institutional controls that we are
20 recommending or are planning to implement, namely, the
21 decommissioning of existing wells, that if we left them
22 running and operating, some of these wells produce a
23 lot of water, our other treatment discussion that I'll
24 give you in about two minutes, it will have a
25 detrimental impact. It will screw it up. So we want

1 to control who uses this groundwater in the valley as
2 well as how it's used. So we are recommending
3 decommissioning some existing and domestic and
4 commercial wells within the groundwater plume.

5 We are also recommending the prohibition
6 or unauthorized new use of groundwater. In other words,
7 new wells in the valley without government approval.

8 Back to the same one, the first one. We
9 are proposing to install some brand new pumping wells
10 within the confines of the plume, and they fall under
11 two categories. Three wells we are recommending to
12 control the dynamics of the plume or the movement. Two
13 of the wells are for better source control. The three
14 wells for plume control, two here, right here. These
15 are called one and two in your handout -- excuse me,
16 two and three. One is up here. Again, it's to control
17 the dynamics of this plume. The other two extraction
18 wells are four and five to control the source at the
19 Curriculum Center and the dry cleaners.

20 We are proposing to extract a total of a
21 hundred gallons per minute out of all of these wells in
22 total, all five together; construct a central water
23 treatment plant; and restore this aquifer to drinkable
24 concentrations. In all of this process, it will
25 probably take a couple of years. We can only guess the

1 number of years right now because of the complexity of
2 this geology. We'll be doing semiannual groundwater
3 monitoring to see how the concentrations hopefully will
4 be declining over time.

5 Now that was both soil I described as
6 well as groundwater. After we conclude this public
7 process that we're in right now, which will end again
8 March 13th, we will hopefully sign a decision document
9 called a record of decision which will select a remedy
10 for the site. That would contain a soil remedy and a
11 groundwater remedy. We will answer questions that are
12 posed to us. We will respond to questions or comments
13 in a document attached to the record of decision called
14 the responsiveness summary. We are planning on signing
15 this document by the end of April.

16 Now I'd like to give you back to Lillian
17 Johnson.

18 MS. JOHNSON: Thank you.

19 Okay. Thank you so much for being very
20 patient with us. As I said early on, we do have -- we
21 did have a lot of information that we needed to share
22 with you because we want you to really understand
23 what's going on and what we've been doing for the last
24 several years. Also, we hope that the information that
25 we have given you tonight will certainly help you in

1 making your decision and in making your -- in better
2 understanding what decisions we have to make, and that
3 you will certainly be more effective in trying to help
4 us make those decisions.

5 So what I need to do right now before we
6 start with the question and answer session, why don't
7 we just take a five-minute break so we can give our
8 stenographer a little rest here and you can stretch.
9 Don't go anywhere.

10 Also, a number of people came in and you
11 did not sign in. We do have a sign-in sheet here. We
12 would like for you to sign in because we use this to
13 help us to update our mailing list so that when we have
14 information that we need to send to you, we will have
15 your names here. So just if you didn't sign in, please
16 sign in.

17 Okay. Caroline just gave me a message
18 saying that the PRP meeting will begin at 8:30 tomorrow
19 at the GERS Building. All right. So why don't we take
20 a five-minute break, but don't leave us.

21 [A SHORT RECESS WAS TAKEN.]

22 MS. JOHNSON: Okay. We need to get
23 started again.

24 Okay. Now this is where we get you
25 involved. This is the session we refer to as questions

1 and answers. So what I would like for you to do if you
2 have questions, please stand up and give us your name
3 because, remember, we have our stenographer here, so
4 she needs your name so that it can become part of the
5 record. And these are the experts here, so they will
6 answer your questions hopefully.

7 Okay. Yes.

8 DR. SMITH: Good evening. My name is
9 Henry Smith. I'm the Director of Water Resource
10 Research at the university.

11 First off, you didn't mention comments,
12 but I'd like to start with a comment and continue with
13 a question if that's okay.

14 I note with interest as one of your
15 criteria the community acceptance criteria, and that
16 actually raises my concern. I read through the
17 document here extensively, and I think I have a
18 sufficient technical background to read this document.
19 However, I'm very concerned that the affected
20 population, and I would suspect the majority of people
21 in this room, do not understand what this document
22 says. I don't mean that as a criticism to the person
23 who wrote it. I just bring it to your attention that
24 in order to have the community acceptance, it's very
25 important that the community understands the language

1 that you're speaking. And at this point I would guess,
2 and I think I can safely guess, that this audience does
3 not represent -- is not representative of the community
4 that's affected by the Tutu aquifer.

5 The video explained that there are
6 several programs in which the community might get
7 assistance in being involved. And my question then is,
8 are there opportunities beyond tonight or beyond the
9 preceding period, which you so graciously extended
10 because of the hurricane, are there opportunities for
11 the community to become involved and opportunities for
12 the EPA to discuss these, let's say, selected
13 alternatives and remediation measures in a language
14 that the community can more effectively participate in?

15 MS. JOHNSON: Okay. I appreciate your
16 comment there. Just let me say this, that this is not
17 the first time that we've been here for a meeting of
18 this nature. As a matter of fact, we've been coming
19 down now since I think it was '92.

20 And I must admit that we have tried in
21 terms of the last few meetings to reach out to the more
22 affected people, I guess you would say, and we've done
23 that through a couple mechanisms. One -- and I don't
24 know if the young lady's here. Is she here? At the
25 last meeting we had here in April, there was a young

1 lady, Fern Callwood -- is it Callwood?

2 MR. DIOSO: Callwood, yes.

3 MS. JOHNSON: She volunteered to pass
4 out information in the community for us. And what we
5 did -- I know I sent her information to do that and so
6 did Lee. And you've had numerous conversations with
7 her; is that correct?

8 MR. DIOSO: Yes.

9 MS. JOHNSON: So that was one outreach
10 technique we used.

11 And one other, if you believe this, I
12 live in New York and I live in a 33-story high-rise
13 building, and one of my neighbors is from St. Thomas.
14 And it just so happens that in September when we were
15 planning this trip, I met his brother, who lives here
16 on the island, and he volunteered also to reach out to
17 the community people. I sent him information which he
18 passed on to the people in the community.

19 I'm mentioning that to you because those
20 are just a few of the mechanisms that we have used to
21 try to get people in the community to help us in terms
22 of disseminating the information.

23 Now to address your question about
24 whether this is the only opportunity, the comment
25 period does end on March 13th. I would think that if

1 there are some particular questions or concerns you
2 have that you would like to sit down on a one-on-one
3 and talk to the people, we're here after the meeting,
4 and then, of course, they will be here tomorrow.
5 Unfortunately, I can't think of an opportunity for you
6 at this time where we could really do more education,
7 to break it down where you could better understand what
8 we are talking about.

9 It is true that it's a very, very
10 technical process that one goes through, and you can't
11 do it like overnight nor can you do it over a week. It
12 has to be a process that goes on for a few years where
13 you stay with us, you know. You start in the beginning
14 when we release the work plan, and then you work with
15 us until we get to this point, but my only suggestion
16 at this particular time is that perhaps I could send
17 you some additional information on the Superfund, and
18 for your particular questions or concerns, maybe you
19 could talk with the people here tonight or you could
20 arrange to maybe talk with them tomorrow. They will be
21 here tomorrow. I'll be gone. If that will help, I
22 mean, we would certainly want to do what we could to
23 help you. Will that help?

24 DR. SMITH: Well, I don't think it's a
25 personal question that I have that you're going to help

1 me.

2 MS. JOHNSON: Well, I'm saying you, but
3 I mean, collectively, would that help?

4 DR. SMITH: I understand exactly what
5 you're saying. I'm involved in an agency that we have
6 problems with public participation.

7 MS. JOHNSON: Sure.

8 DR. SMITH: And like you, we regard it
9 as a commitment. As difficult as it might be, you
10 know, we do seek public participation in what we're
11 doing. I guess one aspect of the question that I asked
12 was, as you move into implementing alternatives that
13 you're going to follow, I think it's very important for
14 the community to understand what's happening.

15 MS. JOHNSON: Sure. I agree with you.

16 DR. SMITH: Okay. And I'm wondering if
17 there are ways or -- there were programs that were
18 mentioned on the video. Are there other ways that the
19 community is going to become educated on what is
20 happening beyond selection of the preferred
21 alternative?

22 MS. JOHNSON: Sure. There are other
23 ways and we can keep you informed on those other ways,
24 and then you can help us because, see, I'm concerned
25 because each time we have a meeting here, it appears

1 that we don't always get the people who are most
2 affected. So maybe you then could help us to make sure
3 that we have those people at any future meetings, and
4 any future information that we disseminate, then you
5 can help us to get that information out to those
6 people.

7 Now I think in the videotape they talk
8 about technical assistance grants, and that's one of
9 the things I talked about at a couple of meetings prior
10 to this. And what that's all about is if you live
11 around a Superfund site and you have an organized
12 group, then if you would like to apply for this
13 technical assistant grant, which is about \$50,000, that
14 the group can apply for it so that you could go out and
15 hire your own technical consultant. That would be one
16 mechanism that you might want to look at. And this
17 technical consultant then would work with you to keep
18 you informed as to the various activities that are
19 going on at the site and, of course, help you to better
20 understand the entire process.

21 So I don't have any of those booklets
22 here tonight. I can certainly, you know -- you give me
23 your address, and I'll certainly send that to you. We
24 have had them in the past because I know, Leonard, you
25 have them in your office; right?

1 MR. REED: Yes.

2 MS. JOHNSON: All right. Next.

3 MS. HARRIGAN-FARRELLY: Good evening.

4 Joan Harrigan-Farrelly, and I have a couple of
5 questions -- well, actually four questions, but I'll be
6 brief. One, does EPA or Health and Human Services plan
7 on monitoring a sample population over the long term to
8 determine if indeed anyone was affected by the
9 contamination?

10 The other question, when will the actual
11 cleanup process begin? I know that in April you make
12 your decision, but when does the actual cleanup process
13 begin, and is that going to be hampered by the budget
14 crisis that we're now facing in terms of the federal
15 government?

16 How long will wells remain capped and
17 how long will the soil and water be affected by the
18 contaminants?

19 And also, how will the soils -- you
20 mentioned soil disposal, and I'm just curious as to how
21 the soils will actually be disposed of.

22 And maybe this is more for DPNR: Are
23 the gas stations and drying cleaning plants currently
24 being monitored to make sure that no further
25 contamination is taking place either in the Tutu area

1 or in the rest of the territory?

2 And, also, since you mentioned that DPNR
3 will be monitoring or must permit any further wells in
4 the area, I'm curious as to on what basis those permits
5 would be given in terms of drilling more wells.

6 And just maybe one question in terms of
7 Dr. Smith's question, what is thermal oxidation?

8 Thank you.

9 MS. JOHNSON: All right. Now you've
10 given us a few things here. So I think the first one
11 I'll refer to one of our representatives from ATSGR.

12 MR. MADDALONI: Let me make a
13 preliminary statement first. EPA itself does not
14 conduct these types of population or what we call
15 epidemiologic studies to follow a population in time to
16 detect, you know, disease incidences, but our sister
17 agency, the Agency for Toxic Substances and Disease
18 Registry, does have that capacity. And we have two
19 representatives from the ATSDR here and I'll introduce
20 Steve Jones first. He's our regional representative,
21 and he'll, I think, pass it along to his colleague.
22 Okay. So Steve.

23 MR. JONES: As Mark just said, my name
24 is Steve Jones. I am with the Agency for Toxic
25 Substances and Disease Registry, ATSDR. It's part of

1 the Department of Health and Human Services. The next
2 step down is U.S. Public Health Service. We're an
3 environmental health agency. We are strictly tasked
4 with doing the environmental evaluations for Superfund
5 EPA hazardous waste sites. And, in fact, we do have
6 currently a public health assessment out for the Tutu
7 well site.

8 Our agency is based in Atlanta. I'm a
9 regional representative. I'm in the same office as the
10 EPA folks that are here in New York, but, like I said,
11 most of our people are in Atlanta. That's all I really
12 have to say in general. With me is Sven Rodenbeck.
13 Sven is a health assessor, and he specifically is one
14 of the authors of the health assessment document, and
15 he can answer your question.

16 MR. RODENBECK: As I understand, the
17 question was, are we, ATSDR or the Department of Health
18 and Human Services, going to monitor people; is that
19 correct?

20 MS. HARRIGAN-FARRELLY: Yes.

21 MR. RODENBECK: Okay. Directly, no. We
22 have not recommended that. It is not stated to do that
23 in our health assessment, the main reason being the
24 difficulty of identifying which people were actually
25 exposed beyond the people that live right here in Tutu,

1 and those people I'm talking about were where the water
2 was trucked around to fill up different cisterns.

3 For the people here in Tutu, it's such a
4 small population, there is not a way to be able to tell
5 if we saw anything, whether it was above what was
6 expected. As what was talked about previously in the
7 presentations on the risk assessment, there's certain --
8 unfortunately, a certain amount of cancers occur. What
9 we're looking for is that above what normally occurs.
10 And to do that, you need an extremely large population
11 in the thousands, but what we are recommending and
12 ATSDR will be doing is education of the physicians here
13 in St. Thomas to educate them on what possible health
14 effects may occur as a result of the exposures that
15 occurred here.

16 So in that regard, if the local
17 physicians start seeing something that they think
18 warrants further investigation, we will be then back to
19 follow up with them. Okay.

20 MS. JOHNSON: Thank you.

21 MR. RODENBECK: Thank you.

22 MS. JOHNSON: What was your next
23 question?

24 MS. HARRIGAN-FARRELLY: When will the
25 actual cleanup process begin, and I was asking also if

1 it would be hampered by the budget crisis.

2 MR. HAUPTMAN: After we sign this record
3 of decision hopefully at the end of April, we then are
4 required to ask the potentially responsible parties,
5 the people who caused the pollution, whether they are
6 willing to implement the remedy we selected in the
7 record of decision.

8 Now the way these remedies are performed
9 is two steps. Let's assume that these people are
10 willing to implement this remedy. That alone at a
11 minimum could be a four month time period for them to
12 agree to sign a legal document with us whereby they
13 promise they will make that remedy with our oversight.

14 Now the implementation that I was just
15 describing is two parts. Number one is design. You
16 have to design all of these pieces to make sure it
17 works, and it could take about two years to design this
18 remedy. Just like you want to build a house, you don't
19 go out there with a shovel. You make a picture first.
20 So you design this remedy first. It takes two years.

21 So the earliest we could possibly see
22 actual physical construction cleanup work take place is
23 two and a half, three years from now.

24 This process, as EPA sees it right now,
25 putting aside the issue over the fact that the

1 Superfund law is up for reauthorization and could
2 possibly be changed and we are not able to predict what
3 our Congressmen are going to put together, let's assume
4 it's something like we have now, the current budget
5 crisis that EPA has experienced, we're still here doing
6 our job. So we hope it will not affect this site or
7 any other site.

8 MS. JOHNSON: Okay. Was that your last --

9 MS. HARRIGAN-FARRELLY: Well, I had also
10 asked how long the wells would remain capped and what
11 would be done with the soil once the soil was removed.

12 MS. KWAN: We are recommending that
13 these wells within the plume area that's going to
14 impact our remediation cleanup schematic be capped
15 until the aquifer is restored.

16 MR. HAUPTMAN: How long will it take,
17 Caroline.

18 MR. HARRIGAN-FARRELLY: And the soil?

19 MS. KWAN: And the soil. When I mention
20 disposal, when we mention off-site disposal, if these
21 soils are contaminated, they should go to an off-island
22 disposal landfill -- I mean, a qualified off-island
23 disposal landfill. We don't have one in St. Thomas, in
24 the Virgin Islands. It will be off-island.

25 MS. HARRIGAN-FARRELLY: It won't be

1 Bovoni?

2 MS. KWAN: The landfill has got to be in
3 compliance with the EPA regulations.

4 MS. HARRIGAN-FARRELLY: And thermal
5 oxidation?

6 MS. KWAN: Excuse me?

7 MS. HARRIGAN-FARRELLY: Thermal
8 oxidation?

9 MS. KWAN: Thermal oxidation is burning
10 off gas because when you do -- when you draw a pipe
11 into the ground and suck the gas out, we want to make
12 sure this gas is just not released, you know, to the
13 environment. So we'll have thermal oxidation, which is
14 a machine that will control the environment, get the
15 gas out, and emit it into the environment. It's not --
16 it will be burnt off in a properly controlled manner
17 instead of just emitting it to the environment.

18 MS. HARRIGAN-FARRELLY: Thank you.

19 MS. JOHNSON: Next, please.

20 MS. GOMEZ: Debra Gomez. How long will
21 the aquifer take to restore?

22 MS. KWAN: We have problems with two
23 properties. Remember what I was saying? DNAPLs, the
24 the dense non-aqueous phase liquids, as I described
25 before, that will act as a continuous releasing source

1 to the fractured bedrock in two locations: the
2 Curriculum Center, at this location, and down by the
3 O'Henry property.

4 As today's technology goes, we don't
5 have the technology that will clean up these two
6 properties as we would like. So we will have to pump
7 and control the movement of this plume, the source,
8 from migrating elsewhere, but we don't have the
9 technology to clean up the problem as we would, you
10 know, like to because it acts as a continuous source.
11 And Sally has something.

12 MS. ODLAND: Yes, I'd like to add a
13 little bit of clarification. It depends very much
14 where in the contaminant plumes the wells are located
15 when they could be restored. If source control is
16 implemented so that the high concentration portions of
17 the groundwater plume are contained close to the
18 sources, and if there is pure product and that's
19 contained close by, the fringes of the plume can clean
20 up quite quickly, within, what, three to five years in
21 some of the outlying areas. And then with careful
22 monitoring, it's conceivable that those could be
23 restored to use if pumping them wasn't going to affect
24 the rest of the plume again and screw up the remedy.

25 Near to the source areas, it could take

1 considerably longer, tens of years. And if there's
2 actually pure product present in some of these areas,
3 it could take -- it may not be able to be done in those
4 particular areas. You could control it and possibly
5 restore the rest.

6 MS. JOHNSON: Thank you. Yes.

7 MS. JENNINGS: Marcella Jennings. I was
8 wondering what type of technology are you going to use
9 to clean up this water, and then are you going to test
10 the water after that? You're talking in the literature
11 about semiannual testing of the groundwater, but are
12 you going to test the water after the technology has
13 been implemented before it's distributed?

14 MS. KWAN: Of course. We would
15 definitely treat -- I mean, we also, as part of this
16 remediation on the groundwater part, when we do the --
17 you know, put the wells in to control the plume, to
18 control the source for migrating further down the
19 valley, we will also then install this water treatment.
20 It will probably be an air-stripper. I mean, I presume
21 it will be an air-stripper. That's the most -- how do
22 you call it -- the most known technology, the most
23 proven effective technology for these contaminants,
24 these volatile organic contaminants that you have.

25 When this water is released -- after

1 it's treated, we will definitely test this water down
2 to a federal drinking water standard before it's
3 released out. We would test the influent before it
4 goes to the stripper and out -- and effluent after it
5 comes out of the stripper to make sure it meets the EPA
6 drinking water standard before we distribute it to
7 anywhere.

8 MS. JENNINGS: Does the Water and Power
9 Authority know of this plan to use the water main?

10 MS. KWAN: Well, the thing is these are
11 the options. That's why we listed four options. We
12 showed three options on the overhead. The last option
13 was discharge to a sewer, which we don't want to
14 because the water will come out and it will be
15 drinkable water. It will be like down to the federal
16 maximum contaminant level, which is MCL, which is like,
17 you know, the drinkable standards.

18 We have talked to WAPA about it. We
19 have talked to the Department of Public Works about a
20 year ago. They are thinking about it, but, like I
21 said, the implementation of this plan will not happen
22 until two and a half to three years down the road. So
23 they're saying it's too far along for them to, you
24 know, to foresee the future.

25 MS. JENNINGS: One more question as far

1 as the air-stripper. I've seen -- I've tested an
2 air-stripper, and it did have some contaminants still
3 in there, and it had to go to an R/O. It was after the
4 R/O, the reverse osmosis, that they did not have a
5 problem.

6 MS. KWAN: Well, that's why we would --
7 like Mel Hauptman was saying, it goes in two stages.
8 We have design and we have construction. During the
9 design stage, we will sample, you know. We will test
10 it out. We will install it. We will do modeling. We
11 will install a miniature plant somewhere to test the
12 technology before we implement it. I mean, we're not
13 just going to go out there and like say, there's an
14 air-stripper. We're not just going to go out there and
15 do it, you know. That's why it's two-part phases.
16 It's the design and also the construction and
17 implementation part and also the O & M. I didn't
18 explain the operation and maintenance. That's very
19 important down the road also, you know, to maintain the
20 treatment center and maintain the wells and the
21 operation of the wells, you know, the pumping wells.

22 MS. JOHNSON: Yes.

23 MS. GJESSING: My name is Helen
24 Gjessing. I'm a member -- I'm here as a member of the
25 League of Women Voters. I have several questions, but

1 I'll only ask one at a time.

2 MS. JOHNSON: You'll have to speak up.

3 MS. GJESSING: I have several questions,
4 but I'll only ask one at a time and let other people
5 have a chance.

6 MS. JOHNSON: We appreciate that. Thank
7 you.

8 MS. GJESSING: So my first question is
9 in regard to the contaminant migration pathway,
10 pathways that are mentioned on page 5. It mentions
11 that transport into the surface water like Turpentine
12 Run, for example, can potentially occur via groundwater
13 discharge. Can it also occur via runoff of
14 contaminated soils?

15 MS. KWAN: Yes.

16 MS. GJESSING: Or from contaminated
17 soils?

18 MS. KWAN: Definitely.

19 MS. GJESSING: All right. If the answer
20 is yes, then a followup to that would relate to the
21 environmental risks, which are on page 7 and 8, which
22 tells us that two indicator species on-site were
23 chosen, the red-tailed hawk and the anole or the
24 lizard. My question is, if the plume is not stopped,
25 would not all of the Mangrove Lagoon life also be at

1 risk?

2 MS. ODLAND: I will answer that one.
3 Right now the plume is nowhere near the Mangrove
4 Lagoon. As far as we can tell right now, the
5 groundwater has not yet discharged into Turpentine Run.
6 The first place that the groundwater from the site will
7 ultimately discharge to would be around -- is that
8 Route 32? There's a small wetland on Route 32, which
9 would be the first place we would expect to see
10 contaminants. From there, water will go on downstream,
11 but the concentrations at the toe of the plumes are
12 very low compared to in the hotter areas of it, and
13 there's considerable dilution -- we expect considerable
14 dilution as it mixes with the surface water, and
15 there's a much, much larger urban impact that affects
16 Turpentine Run that would completely mask the effect of
17 this site's contaminants, and that's the treated
18 discharge from the sewage plant.

19 From what I understand, there were water
20 quality degradation problems in Turpentine Run and down
21 into Mangrove Lagoon, but the chemicals that those are
22 attributed to are typical of sewage effluent and
23 they're not the chemicals that we're seeing at the
24 site. And it's such a huge volume of water relative to
25 the amount of plume that would discharge in there that

1 I don't think you'd ever see those effects.

2 And if the remedy is implemented within
3 the next couple of years, there will be wells near the
4 toe of that plume to keep it from even discharging into
5 the wetlands, which is, what, five miles north of the
6 lagoon, something like that. There's a long, long ways
7 this water would have to go, and it would be -- the
8 site contaminants would be diluted along the way by all
9 the incoming other waters. The lagoon is threatened by
10 urbanization, not by the site chemicals in our opinion.

11 MS. JOHNSON: All right.

12 MS. ODLAND: Was that the only question
13 or were there two?

14 MS. JOHNSON: Right now.

15 Were there other hands in the back or
16 were you just telling her to speak up? Were there
17 hands in the back for questions?

18 [AUDIENCE CAN'T HEAR]

19 MS. ODLAND: I apologize.

20 Okay. The question was whether or not
21 the site chemicals will ultimately impact Mangrove
22 Lagoon. And in our opinion, no, they won't. The
23 contaminant plumes have not -- that are in the
24 groundwater have not yet discharged to surface water as
25 near as we can tell from the current data. When they

1 do discharge, the point where that -- where this site
2 groundwater enters Turpentine Run should be along Route
3 32. After you turn by Fort Mylner and go up over that
4 first hill, it's still I think about four or five miles
5 from Mangrove Lagoon.

6 The concentrations at the toe of the
7 plume are pretty low. They're about 15, 20 parts per
8 billion. And when that water joins the surface water,
9 it becomes diluted.

10 There are degradation problems that
11 we're aware of in the water quality in the lower
12 regions of Turpentine Run and in Mangrove Lagoon, but
13 those can be attributed to discharge of treated water
14 from the sewage treatment plants that discharge
15 directly into the run. And the amounts, the volumes of
16 water that those plants are discharging is much, much
17 greater than any amount of water that would discharge
18 from the plume. So I don't think you would -- and the
19 chemicals that they're seeing in the lagoon are the
20 ones that are associated with sewage treatment plants.
21 They're not the chemicals we're seeing in the site
22 plumes. So we don't think that that's a real worry for
23 this site.

24 And when the containment part of the
25 remedy is enacted when those wells are put -- or a well

1 is put at the toe of the plume, then groundwater from
2 the site shouldn't even discharge into the run at all.

3 I hope that answered it.

4 MS. JOHNSON: Right. Were you able to
5 hear that? When we use the mike, can you hear better?

6 Okay, fine. Thank you.

7 Are there other questions? Yes.

8 DR. SMITH: Henry Smith. I'm aware that
9 there's technology that can treat sewage to a point
10 where you can actually drink the water and it's purer
11 than any water that you find naturally. I think the
12 psychologic effect has a great effect on whether
13 somebody is going to actually consume that water. Are
14 there any areas where the treatment that you are
15 proposing, after treatment using this method, the water
16 goes to directly to a public distribution system rather
17 than discharge the groundwater or some other
18 intermediate means?

19 MR. HAUPTMAN: In my experience in other
20 places, and particularly, in Long Island, New York,
21 where water is also a precious commodity, the only
22 water they have is from the ground, and a lot of it has
23 become contaminated primarily from human activity.
24 Many public wells, particularly in Nassau County, the
25 county closer to New York City, over the years have

1 become contaminated by volatile organic chemicals the
2 same as these have been. And even without EPA and
3 without Superfund, these water companies designed and
4 built air-strippers and treated the water, which meets
5 the federal standards and the New York state standards,
6 and is being put right into the pipeline just like
7 before the stripper ever existed primarily because
8 these water suppliers have no other place to put wells.
9 So again, it's a precious commodity type of discussion.

10 If you don't have a lot of water, you
11 can't kiss an aquifer good-bye and put a well someplace
12 else. You can only use what you have. But to answer
13 your question in the simple tense, yes, this water has
14 been used over many years directly for consumption by
15 people.

16 MS. JOHNSON: Okay. Are there other
17 questions or comments? We want to give everybody an
18 opportunity before I go around again. If not, then
19 we'll go back to you.

20 MS. GJESSING: Well, maybe I should come
21 up here.

22 MS. JOHNSON: Why don't you do that.

23 MS. GJESSING: Okay. I wanted to return
24 just for a second to this off-gas treatment, the
25 catalytic oxidation and the thermal oxidation. My

1 question is, what is the result of those treatments?
2 What happens to the gas? Is it converted, it's
3 oxidized; it's changed in form? Is it released into
4 the environment as a harmless, you know, converted gas
5 or what?

6 MR. HAUPTMAN: This thermal oxidation is
7 nothing more than a glorified torch. It's a flare.
8 Now these off-gases probably don't have enough
9 chemicals in them to burn by themselves. If you put a
10 match to this vapor, it probably will not burn, plus
11 it's wet because it came out of the ground. So we
12 might have to enrich this gas with something like
13 propane to make sure it burns at the right temperature
14 and has the right structure of these chemicals because
15 we want to turn these chemicals into CO-2 and water if
16 it works the right way.

17 MS. GJESSING: Okay.

18 MR. HAUPTMAN: This is not brilliant
19 technology either, I must say.

20 MS. GJESSING: Okay. I understand. All
21 right. The last question I had was on the DNAPLs. It
22 was said that EPA will restore the groundwater to
23 potability except where DNAPLs are present. My
24 question was, do you -- is it quite certain the
25 location of the DNAPLs? Those two areas that you've

1 identified where they are present, are those with any
2 certainty the only areas they are present; and,
3 secondly, what can be done to contain them other than
4 to not allow rock removal? I mean, what prevents them
5 from spreading into the, you know, groundwater and
6 other places?

7 MR. HAUPTMAN: These gray hatched areas
8 are where we have every reason to believe DNAPLs are
9 present under the ground. Now how do we know that? We
10 know we have contaminated groundwater, drinking water.
11 By putting a well in, you pull out a water sample, and
12 you analyze the water, and it's got chemicals in it.

13 Did we ever put a hole in the ground
14 here and find pure materials? The answer is no. So we
15 have to go on what we call indirect indication of
16 DNAPLs. For example, the concentration of the
17 groundwater at these two locations is significantly
18 higher than what would result if we just took minor
19 concentrations in the subsurface before you got to the
20 water table, which means it looks to us like we have
21 pure material that is leaking into the groundwater
22 that's resulting in very, very high concentrations in
23 the groundwater at those localized places. So we
24 indirectly think we have DNAPLs.

25 Now how do you fix it? The two

1 containment wells will prevent the spread. The soil
2 vapor extraction is going to try to get at this source
3 that's going in to the saturated zone above the water
4 table. If we could, we'd try to put a hole in the
5 ground and try to suck out the pure DNAPL itself. The
6 trouble is you can't find it usually because it doesn't
7 behave under normal conditions, especially in fractured
8 rock. It's going to find the nearest crack and go that
9 way or go that way. It doesn't follow the laws of
10 physics other than the pure law of gravity, and who
11 knows where all these cracks are. So that's the best
12 we can do.

13 MS. JOHNSON: Thank you, Mel. You were
14 very demonstrative there.

15 Okay. Are there other comments or
16 questions? Go on, put your hand up there. Yes.

17 MS. HARRIGAN-FARRELLY: I again wanted
18 to ask the question as to what monitoring procedures
19 are now in place to ensure that there is no further
20 contamination either in this site or in any other site
21 or at any other site.

22 MS. JOHNSON: Would you repeat the
23 question again please? Just repeat the question again
24 for them.

25 MS. HARRIGAN-FARRELLY: I wanted to know

1 if there are any monitoring procedures put in place to
2 ensure that there is no further contamination either at
3 this site or that other contamination is not going on
4 at other dry cleaning sites or gas stations and so on.

5 MR. HAUPTMAN: Well, this site we
6 believe we've got pretty well covered. I mean, we've
7 been to those facilities many, many times, and we're
8 going to be doing that in the future even before the
9 remedy is implemented. And, of course, we have our
10 territorial people also doing the same thing, namely,
11 DPNR.

12 Now is the same thing happening on other
13 sites on the island? The answer is probably yes.
14 Where are they? We're trying to find that out right
15 now. There are two programs, one to go after gasoline
16 stations. It's called the Underground Storage Tank
17 Program to make sure these tanks are intact and not
18 leaking because that's what these things tend to do
19 over time. And the major petroleum companies tend to
20 do a pretty good job of making sure their tanks are not
21 leaking because you see a lot of them being ripped out
22 all of a sudden as soon as this law got passed. The
23 smallest stations, the private guys, I'd be more
24 worried about him because he's probably not doing it as
25 aggressively.

1 Other dry cleaners, in fact, all dry cleaners
2 generate this very same kind of material, this waste,
3 perchloroethylene, perk. They're supposed to under
4 current federal law handle and dispose of those
5 chemicals properly. And we have some inspection taking
6 place in the islands, and we've been to every single
7 dry cleaner. I don't know that answer right now
8 because it's covered under a different federal law.
9 And that's a lousy excuse, but that's the one I'm going
10 to give you tonight.

11 MS. JOHNSON: Thank you, Mel.

12 Okay. It's been a very, very long day,
13 but we're hanging in here. Yes, let's go to the back.
14 Yes, sir, in the blue.

15 MR. ALLEN: I can't speak so loud. I
16 may have to use the mike.

17 MS. JOHNSON: Please come right up.
18 Okay. Just give her your name.

19 MR. ALLEN: My name is Moses Allen. I
20 represent Aquathin Water Purification. My question is
21 concerning the chart the gentleman had on the board.

22 [AUDIENCE CAN'T HEAR]

23 MS. JOHNSON: Do you have a cold?

24 MR. ALLEN: My question is concerning
25 the chart -- I have a cold; that's why -- the gentleman

1 had on board. He was showing there a well that was at
2 this point and there was another well that was at that
3 point. Do you have an idea of how much pollution,
4 which is chemicals, might have seeped into the ground?

5 MR. HAUPTMAN: This one and this one,
6 you're talking about?

7 MR. ALLEN: Right.

8 MS. KWAN: We have installed about -- a
9 few monitoring wells in the LAGA Building, and the
10 highest concentration at the LAGA Building we have is
11 360 parts per billion of PCE and our drinking water
12 standard is 5 parts per billion. So we have problems
13 in this area.

14 MR. ALLEN: So how much area would you
15 say that amount covered ground wise? Don't you think
16 that you have a chance of being -- since that is the
17 water level on the water table, the water would be able
18 to be spreading out in a vast amount in a bigger area,
19 don't you think?

20 MS. KWAN: We have, we have installed
21 them around the downgradient of this area to monitor
22 the width of the plume. And we felt that this -- we
23 have a pretty good idea that -- we mapped out this
24 plume area, and it's probably around the whole area of
25 this property.

1 MR. ALLEN: My reason for asking the
2 question is because if I have to shock a well, which is
3 to chlorinate a well, the amount of -- well, maybe it's
4 a gallon of water -- a gallon of Clorox or whatever,
5 the amount of water that would spread out through that
6 well, you know, to shock that well would be surprising.
7 That's what I'm asking because we're dealing with
8 gasoline or benzene or whatever. That's why.

9 MR. HAUPTMAN: Are you asking how much
10 these operators first spilled into the ground?

11 MR. ALLEN: If you have an idea of how
12 much gallons might have been.

13 MR. HAUPTMAN: No.

14 MS. KWAN: No.

15 MR. ALLEN: How would you assess that at
16 that point then?

17 MR. HAUPTMAN: Because we put a lot of
18 monitoring wells around, and for many years you sample
19 all of the wells, and you can draw these outlines by
20 those concentrations.

21 MS. JENNINGS: How much of the area is
22 indicated?

23 MR. HAUPTMAN: How much plume?

24 MS. JENNINGS: At the LAGA Building.

25 MR. BENNETT: The length of the plume

1 that's described on the figure is about three to four
2 thousand feet long and the width of it is probably --

3 MR. HAUPTMAN: That's the whole thing
4 though.

5 MR. BENNETT: Right. That's the entire
6 envelope that's encircled right there on the figure
7 there.

8 MR. HAUPTMAN: She was asking about the
9 LAGA footprint.

10 MR. BENNETT: The scale here on the
11 bottom of the figure is 200 feet. There's a bar scale
12 on the bottom there. Right there is 200 feet to the
13 LAGA plume. Just a second and we'll give you an
14 answer.

15 It's about five hundred to a thousand
16 feet, the length of the LAGA plume.

17 MS. JOHNSON: Caroline, he has one more
18 question for you, but I was telling him that since he's
19 having trouble speaking, when we finish up, you can sit
20 down with him.

21 MS. KWAN: Okay.

22 MS. JOHNSON: Okay, fine.

23 MR. ALLEN: Maybe everyone would like to
24 hear.

25 MS. JOHNSON: Okay. What is it?

1 His question is, what would be the
2 solution used to clean up the water?

3 MR. HAUPTMAN: We're going to install
4 extraction wells, pump the groundwater out, and put it
5 through a treatment system that involves an
6 air-stripper. For those of you who don't know what
7 that is, it's typically a tower that has packing in it.
8 The water trickles through the top and you blow air
9 through the bottom, and it drives the contaminants out
10 of the water phase into the air phase. You get clean
11 water coming out the bottom and you get dirty air
12 coming out the top and you control both ends of it.
13 That's an air-stripper.

14 MS. JOHNSON: Okay. Very good. Feel
15 better.

16 Are there -- just a moment now. Did I
17 see another hand in the back before?

18 Okay. Fine.

19 MS. SCOTT-WILLIAMS: Good evening. My
20 name is Stephanie Scott-Willlliams. I'm a resident of
21 New Tutu. And I just want to ask a very simple
22 question because I think a lot of people would like to
23 know -- I came in late and I apologize, but I'd like to
24 know, what can the residents do to reduce any risk
25 involved?

1 I was trying to skim through this and I
2 saw human risk and it was talking about soil, and the
3 six to a hundred thousand and all that, ten thousand
4 but, you know, in plain, old, simple English, what can
5 the residents do to reduce this risk of cancer because
6 they said what can be expected is that there's a
7 certain amount of cancers that will occur. Are there
8 any specific types that would occur that we might be
9 looking for? I'm not trying to be --

10 MS. JOHNSON: No, no. You go right
11 ahead.

12 MS. SCOTT-WILLIAMS: I just want to
13 know, you know, for my grandchildren and my
14 great-grandchildren, what can we expect and what types
15 of situations?

16 MR. MADDALONI: As far as how to reduce
17 exposure, most, -- well, how to reduce your risk, most
18 of the risk is coming from the groundwater, and we're
19 dealing with that now. So you should take it upon
20 yourself to do whatever you need to do to ensure that
21 you're not drinking untreated groundwater out of this
22 aquifer.

23 MS. SCOTT-WILLIAMS: One problem I have
24 about the reports that we get, we often hear two months
25 later that the water we drank was contaminated. Now

1 are we stupid? I mean, you're telling me what I drank
2 was contaminated. Can we avoid something like that
3 happening? Can we avoid drinking contaminated water?
4 I mean, these reports come out afterwards, and you say,
5 hey, you all just drank a bunch --

6 MR. MADDALONI: We're constrained by the
7 technology. And, you know, as we are able to detect
8 problems and disseminate that information, that's how
9 it's attained. And I mean, I grant you that it's water
10 under the bridge in a lot of situations and we can't
11 undo past exposure. We simply can't. My only small
12 amount of comfort to you is that the cancer risk
13 estimates are based on long-term, 30-year exposure,
14 every day drinking over two quarts of water a day. So
15 the levels, you know, you're still going to have some
16 small element of risk, but again, I said that, you
17 know, the air we're breathing has a small amount of
18 carcinogens in it. So we're all at small levels of
19 risk.

20 And EPA has defined a level of
21 acceptable risk. And I grant you it's a value judgment
22 attached to that. And that's what we operate under,
23 and that was dictated by the law when it was written in
24 1980, what acceptable risk is. And, you know, you
25 personally, your constitution may not agree with that,

1 and that's something that you would probably have to
2 take up with Congress to have that changed, how we
3 define acceptable risk, but, you know, that's what we
4 operate under. And where we have determined there's an
5 unacceptable risk, we are doing everything in our power
6 to remedy it.

7 MS. SCOTT-WILLIAMS: Thank you.

8 MS. JOHNSON: Okay. Next? Any more
9 questions?

10 MR. JOWERS: Jay Jowers. I would like
11 to know if the aquifer can be changed direction through
12 construction, like moving around, dynamiting or moving
13 earth because we have a lot of construction going on
14 now, and when we ask for soil tests, it's put on the
15 back burner, and we never test the soil to make sure
16 there are not contaminants moving around. And there is
17 quite a lot of construction in this area, as you can
18 tell. There is a new sewer treatment plant going up.
19 They're just starting that plant right on the road
20 here. Is that going to be monitored by you or is it
21 going to be monitored by somebody else? Does it not
22 contaminate the aquifer again, and can the aquifer be
23 moved if it's done by dynamiting or by man or whatever?

24 MR. HAUPTMAN: The biggest effect that
25 people have on groundwater flow is by putting in

1 groundwater wells, by pulling the groundwater out,
2 which has already happened in this valley. Can we
3 change the dynamics of this aquifer by changing the
4 rock structure? Probably not. It would be a
5 monumental task to do it.

6 And the first point that I described
7 about mankind pulling water out of the ground and
8 affecting the dynamics of the aquifer or drinking water
9 that's contaminated, our remedy tries to address that.
10 It tries to tell people if you live inside this plume
11 and you have a residential well and you're not being
12 provided water by truck, which many people are through
13 our early action, the easiest recommendation is don't
14 drink that water because if you're in a plume, you
15 probably have dirty water. Thank you.

16 MS. JOHNSON: Are there any more
17 comments? Oh, okay.

18 MS. JENNINGS: Just one more. Marcella
19 Jennings again. I'd like to address Miss Kwan. When
20 they said they cleaned the cisterns, I want to know how
21 and what techniques they used to clean the cisterns
22 that received this contaminated water, and also did
23 they recommend at some point that those units use some
24 kind of charcoal filtration or activated charcoal for
25 any residuals?

1 MS. KWAN: Back earlier when our EPA
2 folks did the early removal action, I was not involved,
3 but I read the report back then, how they disinfect the
4 cisterns. I assume they disinfected using an
5 appropriate method, but I don't think they -- how do
6 you call it -- they did anything else after they
7 disinfected and they cleaned it out, and also they did
8 the plumbing of the houses, the residential houses to
9 make sure that these cisterns are not connected for the
10 regular use of the house. But did you ask specifically
11 something else besides cleaning the cisterns?

12 MS. JENNINGS: Did they recommend some
13 type of filtration for any of the residuals that may
14 have occurred in the water?

15 MS. KWAN: No, I don't think -- no, we
16 did not, but the thing is the affected residents are
17 being provided with trucked water for their potable use
18 throughout all the years that they were closed down
19 since '88 in the Tutu area.

20 MS. JOHNSON: Are there any more
21 comments?

22 Okay. Thank you for coming. If there
23 are no more comments or questions at this time, I want
24 to personally thank you for coming out and -- please
25 sit down though -- and being very patient with us,

1 because, as I said early on, there was a lot of
2 information we had to impart tonight, and it was very,
3 very technical. And so I do appreciate your patience
4 for being here, and I do hope that you've gotten
5 something out of this meeting tonight and that you will
6 write us comments, write in your comments. If there
7 are any other questions that you need clarified, we
8 will be here for a little while longer because we have
9 to put the tables back, but in the meantime, Caroline's
10 address and telephone number is on the proposed plan.
11 So you might want to give her a call or write to her.
12 So, again, I do thank you and I really do appreciate
13 your sitting through this rather long meeting tonight.
14 Thank you.

15 [MEETING WAS ADJOURNED.]
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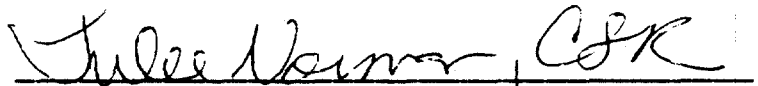
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IN WITNESS WHEREOF, I hereby attach my signature and seal this 21st day of March, 1996.



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